CAA JOURNAL

U.S. DEPARTMENT OF COMMERCE

INFORMATION AND STATISTICS SERVICE

Duke University Library

Wright Heads CAA, Succeeding Stanton, Who Becomes Deputy

Charles I. Stanton has resigned as Administrator of Civil Aeronautics. Theodore P. Wright was nominated by the President to succeed him, the appointment being confirmed September 20. Mr. Stanton resumes his post as Deputy Administrator, and his Civil Service career in which he has served the CAA and its predecessor organizations for more than 20 years.

In his letter accepting Mr. Stanton's resignation, tendered on August 18, the President, in closing, wrote: "Rest assured I appreciate the splendid service you have rendered and the devotion you have given our aviation industry, in your many years with the Government."

The appointment of Mr. Wright was announced by William A. M. Burden, Assistant Secretary of Commerce.

Careers Parallel.—Both men have had wide experience in aviation, both military and civil. Mr. Stanton served in the Army during the first World War and Mr. Wright in the Navy. Upon leaving military service each entered civil aviation.

Mr. Stanton was moved up from Deputy Administrator January 15, 1942, when he became Acting Administrator in which status he remained until the following July when his appointment as Administrator was confirmed by the Senate.

He brought to his expanded duties a wide, and hard-won, experience in both military and civil aviation, which gave him a grasp of a confused situation in which wartime need and civilian production capacity were tangled.

He won his wings in the first World War, having been commissioned at Kelly Field, Texas, and assigned to the 122nd Aero Squadron, U. S. Army. His career in civil aviation began in 1918 when as a test pilot he flew the first United States airmail routes and two years later he was Assistant General Superintendent of Air Mail for the U. S. Postoffice Department.

He left the Post Office Department in 1923 to become executive officer of the National Aeronautical Association. Subsequently he was with the U. S. Engineering Corps and engineering firms until 1927 when he returned to civilian aviation as airplane and engine inspector of the just established Aeronautics Branch of the Department of Commerce. His engineering experience fitted him for broader duties and he was transferred to the Airways Division as Airways Extension Superintendent. From that position he moved steadily up through the grades to Administrator of Civil Aeronautics.

T. P. Wright

C. I. Stanton

Mr. Stanton, who was born at Medford, Mass., July 28, 1893, attended Tufts College, being graduated in 1917 with a B.S. degree. His alma mater conferred on him the honorary degree of Doctor of Science, July 18, 1944. He married in 1917 and is the father of three children. Charles Jr., is a lieutenant in the Marine Corps, and like his father in the first World War, a flier.

Wright Navy Flier.—Mr. Wright was commissioned as Ensign in the U. S. Naval Reserve Flying Corps in 1918, and promoted to Lieutenant in 1920. He was later appointed as an inspector of Naval aircraft, and during his last year of service in 1921, was appointed Superintendent

(*See Wright, page* 103)

2 CAA Men Praised By Sec. Stimson for Saving Army Pilot

Two employes of the Civil Aeronautics Administration have received commendations from the Secretary of War for risking their lives to save an Army pilot who crashed at the Rock Springs, Wyo., airport.

"The accomplishment of these men," Stimson said, "has added another inspiring chapter to the valiant manner in which our civilians are contributing to the war effort."

They are Floyd C. Emanuel, Principal Radio Electrician, and Clair B. Colburn, Chief Aircraft Communicator, and the officer saved was Lt. John R. Phillips.

Lieutenant Phillips' Thunderbolt crashed on the Rock Springs field May 3, coming to a stop on its back with the canopy almost completely buried in the dirt. Colburn broke the plexi-glas with a pickax, then with fragments and his bare hands dug dirt away to allow the pilot to get air. Airport Manager Kenneth Cook assisted in this operation.

Pilot Dragged from Plane.—Colburn cut the straps of the pilot's safety belt, parachute harness and life jacket, and, with Emanuel and Cook, removed him through a small hole in the canopy.

Colburn and Emanuel cut away the pilot's sleeve and bandaged his smashed right hand, and were starting to carry him away when an ambulance arrived.

Throughout the rescue, 100 octane gasoline was running out of the tanks and saturating the clothing of those assisting the pilot. With explosive gas fumes escaping at the same time, they were in continual fire hazard.

Emanuel had recently completed a tour of duty with the CAA in Alaska, for which he volunteered when the Japs occupied the Aleutians and the personnel situation was critical. He is 28 and a native of San Angelo, Texas. Colburn is 29, and was born in Valentine, Nebraska.

ENGINEERING LIBRARY
DUKE UNIVERSITY
DURHAM, N. C.

Alaska is Seen As Holiday Land For Peacetime Private Fliers

Charles E. Planck, Chief of the Civil Aeronautics Administration Division of Current Information, brings back from a trip to Alaska, an encouraging prospect of private postwar flying there. It is based on the experience of an Alaskan veteran Civil Aeronautics Administration flier, who believes the aerial tourist will be surprised and pleased with both summer and winter flying there.

Postwar private flying in Alaska will be a major activity there, and the Civil Aeronautics Administration is now making plans to welcome aerial tourists soon after the war is ended.

Weather and terrain conditions in the Territory dictate special requirements for safety, but CAA pilots, with long flying experience there, believe the average pilot can fly anywhere throughout the whole country without danger, provided he observes the precautions already proved to be necessary. Adequate flying aids are now in operation along the 7,000 miles of airways to guarantee safety and pleasant flying for the conservative pilot. These Alaskan veterans expect smart aleck fliers will cause trouble, but they know how to seek and find lost aviators from having done it many times before.

C. E. Planck

Favors Winter Flying.—Burleigh Putnam, Chief, General Inspection Division, Eighth Region, is one who would welcome flying tourists to Alaska. He believes that they would enjoy their visits summer or winter, and, with typical Alaskan hardihood, he rather leans toward winter as the ideal time. Forced landings in the bush country in winter are easier and safer than forced landings in summer, he believes, and the job of finding the lost plane and bringing the pilot and passengers back to town is easier because the solidly frozen ground makes landings less hazardous.

But Putnam does not stress the accidents which may happen to new fliers in Alaska. He believes newcomers should be "briefed" by CAA aeronautical inspectors, informed of the Territorial laws which require certain emergency equipment such as two-way radio, concentrated food, a gun, fishing tackle, snowshoes, etc., and urged to comply for their own safety. If they will take advice and follow directions, Putnam believes, aerial touring in Alaska can be thrilling, educational and perfectly safe.

He is now gathering material for publication in a Civil Aeronautics Administration handbook of Alaskan flying. This will be a compendium of valuable information resulting from the years of flying by "bush" pilots, airline pilots and CAA pilots who have been flying in Alaska for years.

Emergency Fields.—Up the Alcan Highway, Putnam points out, principal fields are about 200 miles apart, with emergency fields in between in every case. The principal stops would be Edmonton, Grand Prairie, Fort St. John, Fort Nelson, Watson Lake and White Horse. Inside Alaska, where the CAA now has fields approximately every 100 miles along the airways, the newcomer should have little difficulty. Because air-marking is lacking, and there are few landmarks such as roads and railroads to follow, the use of simple radio equipment for following range signals is considered the most satisfactory navigating method.

Basing at Fairbanks or Anchorage, the aerial tourist would have a wide variety of scenic routes of about 100 to 200 miles to choose from. By air, the fishing and hunting opportunities of Alaska are wide open. Expense, after the inflated war period is past, will not be excessive, Putnam believes. The average Alaskan "roadhouse" (trail-side hotel) charges $3 to $4 a day with meals. Gasoline averages 30 cents a gallon and Putnam believes a postwar top of $1 a gallon might be expected in the more remote places along the Alcan Highway where transportation difficulties are greatest. Food in Alaska costs 25 to 40 per cent more than in the States.

Fly Watersheds Home.—There is little reason for getting lost in Alaska, Putnam believes. By "flying the watersheds," any pilot can reach a place of safety. Always fly downstream and you will find a settlement, Putnam advises. You determine the direction of a river's flow by "flying up a tree." Trees that fall in the river always snag their roots on a sandbar or the bottom and swing around with the tree-top downstream. These simple rules are almost all the new pilot will need to prevent being badly lost. Maps of Alaska in the same detail as those used for airway flying in the United States will be available for pilots there.

Named CAB Economic Director

The Civil Aeronautics Board announces the appointment of Irston Robert Barnes, of Hamden, Conn., as Director of the Economic Bureau of the Board. For the past 3 years he served as consulting economist in the U. S. Department of Justice.

Exam Schedules Unchanged

Written and practical exams for pilots, mechanics, and ground instructors' certificates and ratings will continue on different itinerary schedules, according to a CAA safety regulation instruction. Except under very unusual circumstances, however, flight tests and practical exams are not to be given on the same day.

Vol. 5 September 15, 1944 No. 9

CIVIL AERONAUTICS JOURNAL

Jesse H. Jones,
Secretary of Commerce

Charles I. Stanton,
Administrator of Civil Aeronautics

Issued on the 15th of each month. Subscription $0.50 a year. Sold by the Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C. Approved by the Bureau of the Budget.

INFORMATION AND STATISTICS

Letters To The Editor

All inquiries pertaining to the editorial content of the Journal should be addressed thus: Editor, Civil Aeronautics Journal, Reference A250, Civil Aeronautics Administration, Washington 25, D. C.

Study of Aviation Postwar Radio Problems Is Resumed

Radio in its peacetime relationship to aviation is again to engage the attention of the Radio Technical Commission for Aeronautics. Dr. J. H. Dellinger, chairman, announces resumption of activities which were halted by our entry into the war. He has named three special committees to direct the studies contemplated.

They follow: Airborne Radio Communication and Navigation, Chairman Colonel D. C. Doubleday, Army Air Forces, Office of Air Communications. Ground Radio Communications and Navigation, Chairman Commander D. S. Little, Bureau of Aeronautics, Navy Department. Test Procedures and Standards, Chairman L. M. Sherer, Civil Aeronautics Administration.

Dr. Dellinger's announcement calls attention to what is described as one of the most pressing problems confronting the aeronautical industry; the use of very high frequency and ultra high frequency radio equipment. Many new developments have been made by the military service in these frequency bands, several of which are carried in the secret classification.

It is highly probable some of these will be widely applied in postwar civil aviation and it is expected the secrecy restrictions will be relaxed so the technical aspects of the systems may be made available for study by interested agencies. The studies will form the groundwork for the development of aeronautical radio equipment and the improvement of many present flight control procedures.

Aerial Signpost System Adopted; Army Lifts Ban

Horizontal "signposts" to guide fliers soon will cover continental United States except an area 150 miles deep flanking the Pacific Ocean and the Territory of Alaska.

The War Department lifted the ban in response to a recommendation from the CAA in order that private flying be facilitated.

Based upon its original air-marking program, begun in 1935, and upon a recent intensive three-year study, the CAA will set a goal of getting every city, town and village in the country marked so that its exact location can be readily determined by pilots. About 100,000 air markers or air guides will be required to cover Continental United States adequately. When these are installed, the possibility of a pilot becoming lost during a contact flight is virtually eliminated, in the opinion of Blanche Noyes, CAA Air Marking Specialist in charge of the program. The CAA has already started marking the roofs of its range station and communications station buildings in accordance with the new system.

Grids Adopted.—During a three-year study, the CAA has examined a large number of suggestions and the so-called grid system, or air guides which will hereafter be standard, was adopted.

It provides for the lettering of the name of the town on a roof or wall in letters from 10 to 20 feet high, and also the latitude and longitude of the place, separated by an arrow pointing to true North. Special symbols will be used to point the direction of and give the mileage to the nearest Airpark, Airport, or other landing area. These four items of information, the name of the town, its latitude and longitude, the indication of true North and the distance to the nearest safe landing area comprise a complete air guide for the pilot.

Latitude and longitude figures are given in degrees and tenths, and reference to standard flying maps will make it possible for any flier to pinpoint his position positively. Because, in the United States, all latitude is North and all longitude is West —the letters N. and W. are not included. The latitude figure is always first in normal reading position, and, in the United States the latitude is always the smaller.

Mountains Guideposts.—Air guides may also be placed on highways; on mountain sides where the letters and arrows will be formed of crushed rock; on lawns, road intersections and clover-leafs, with small shrubs forming the letters; and in desert areas, where letters made of metal strips with enamel coating are mounted on posts a few feet above the ground. Markers on some roofs in towns may be illuminated at night.

Texas officials are urging every town to "get on the air guide map." Alabama,

(*See Signpost, page* 111)

Now For Practical Instruction

First Inter-American Students Finish CAA Aviation Instruction

In the group pictured, from left to right, are: Vincente Guevara, Colombia, Sperry Gyroscope; Rene Raeder, Brazil, Pratt and Whitney; Bruce Uthus, Director of CAA Manpower Training; Jess D. Green, CAA Co-ordinator of Inter-American Training; Jayr Veiga, Brazil, Pratt and Whitney, and Juan Torres, Cuba, Piper Aircraft.

The first group of Inter-American students to complete their studies in the Civil Aeronautics Administration program are now in manufacturing plants in the United States for practical instruction.

They will spend six months learning procedures and standard practices, and then will return to their homes where they will take jobs in the aviation industries of their native countries.

Wright (*Continued from page* 101)

of Construction of Naval Aircraft for the New York district.

After leaving the Navy Mr. Wright entered the organization known at that time as the Curtiss Aeroplane and Motor Company, Inc., as Executive Engineer. Under his supervision as Chief Engineer many famous designeers were turned out. Among them were prize-winning Pulitzer and Snyder cup racers and such famous military aircraft as the Hawk, Falcon, Helldiver, Shrike, and Condor; also such commercial types as the Robin, Fledgling, Kingbird, and Commercial Condor. These were followed by the sensational Tanager Airplane which won the Guggenheim Safe Aircraft Competition for the Curtiss Airplane and Motor Company. Mr. Wright's paper "The Tanager—A Safe Airplane" won for him the Society of Automotive Engineers' coveted Wright Brothers medal.

During this time he inaugurated the "Project Engineer" system of aircraft design, development, and manufacture which has become standard practice among practically all major aircraft manufacturers.

In June, 1940 Mr. Wright was called to Washington to serve with the Advisory Committee for the Council of National Defense. After some six months he returned to his duties with Curtiss-Wright. However, in February, 1941 he was recalled at the request of Mr. Knudsen, now Lt. Gen. Knudsen, to act as Assistant Chief of the Aircraft Branch of the Office of Production Management, later WPB. In March, 1943 the former Aircraft Branch of the WPB was reorganized and became the Aircraft Resources Control Office of the Aircraft Production Board, with Mr. Wright as Director.

Mr. Wright was born at Galesburg, Illinois, May 25, 1895. He received the Bachelor of Science degree from Lombard College, Galesburg, Illinois, 1915, and B.S. in Architectural Engineering from Massachusetts Institute of Technology in 1918. He received his honorary Doctor of Science degree from Knox College, Galesburg, Illinois, in recognition of his "distinguished services to Aeronautics." He has contributed extensively to the literature of aircraft manufacturing.

CAB Investigations Show Human Error Cause of Many Accidents

Reports on eighteen air accidents made by the Civil Aeronautics Board show the element of human error to have been the predominating cause. Twenty-six persons were killed. In one near Elkins, W. Virginia, the pilot and four passengers died; in another, near Wrightsville, Ark., the toll was four—an instructor and three students.

The prime cause of the Elkins accident is believed to have been an effort by the pilot to orient himself by ground observation in a region with which he was not familiar. The instructor involved in the crash dove too low in escaping a heavy overcast to make recovery.

Tail winds and engine trouble, of undetermined orgin, are given as causes of other accidents and in yet another fire brought a crop duster down to his death. Investigation disclosed the sulphur hopper vent was not closed which is a precaution which should have been taken.

Cause Undetermined.—An instructor was killed in an accident near Lockport, Ill., and his student seriously hurt. The cause of this accident is not known. Another of unknown origin occurred near Ypsilanti, Michigan. In this one the pilot and his passenger died.

Jumped Too Late.—At Kilgore, Texas, an instructor and his student were killed, and, from the meager evidence available, it was apparent that the instructor had tried to free the student from gosport equipment so he could jump. Time was too short and both were found swathed in partially opened parachutes.

Failed To Orient Himself.—The pilot of the plane which crashed near Elkins had accumulated more than 10,000 hours solo time. He was flying from Oklahoma City, Okla., to Washington, D. C., where a relative of one of his passengers lay critically ill. He got off his planned course and attempted to make an emergency landing at the Elkins Airport. The probable cause of the accident was given as an effort on the part of the pilot to orient himself and remain in contact with a narrow winding valley.

Two Killed in Arizona.—An instructor and his student were killed in a crash near Holbrook. The cause of this accident could not be determined.

Heavy Overcast Fatal. — Near Wrightsville, Ark., an instructor and three students were killed in an accident resulting from an effort to fly clear of a heavy overcast. It appears from evidence available that the pilot tried to regain contact with the ground and flew very low before he did so. The plane must have been put into a powerful climb to avoid crashing for a part of the left wing was torn off.

Recklessness and Pranking. — At Ridgeland, S. C., a pilot was killed and his passenger seriously injured in an accident, the cause of which is given as recklessness in too low acrobatic flying. A student pilot was killed near Russelville, Ark., playing "follow the leader" with a fellow student.

Tail Winds.—A pilot who was killed in an accident near Ellsworth, Wisconsin, is believed to have been deluded by a tailwind, thinking that his air speed was greater than it actually was, and in an effort to recover altitude stalled his plane. The pilot died instantly and his passenger sustained mortal injuries. A gusty wind caught a taxiing plane at the Ann Arbor, Mich., airport and tipped it over, bottom up. The pilot sustained a fractured vertebra.

Collision in Mid-Air.—Wind also played a malignant part in the collision over the Cedar Rapids, Iowa, Airport which resulted in the death of an instructor and student. The report on this accident: "Maneuvers over area which should have been avoided under the wind conditions prevailing."

Engines Go Dead.—Near Laurens, S. C., an instructor and his student were killed when a forced landing was attempted with a dead engine. Cause of the engine's failure was not determined. Near Bellefonte, Pa., a pilot was killed and the co-pilot badly hurt when the engine in their plane failed and the pilot attempted to bring his craft down in a narrow suburban street at night.

Carelessness Casualty.—At Taneytown, Md., a man walked into the propeller of an airplane which had just taxied to a stop at the airport, and was badly hurt. The cause of the accident was reported as carelessness on the part of the victim.

Too Much Sun.—A student pilot in attempting to land at the Oil City, Pa., airport slashed into a tree, shearing off the top about 35 feet from the ground. He was seriously injured. He was partially blinded by the late afternoon sun and did not see the tree until too late to avoid it.

Stall Too Low.—Accidents near Dallas, Tex., and Blacksburg, Va., are attributed to stalls at levels too low for recovery. Pilot and passenger were seriously injured in the Dallas crash and in the one at Blacksburg, the instructor was badly hurt, but his student escaped with minor hurts.

CAA Shows "Lab" Aids For Air Education

Civil Aeronautics Administration's aviation education service has assembled a collection of laboratory equipment for use in schools which offer aviation courses as part of their regular curriculum. Many of the models can be built in school work rooms; others may be purchased from manufacturers and others are salvaged units. The exhibition is open to teachers and others qualified to see it in the Department of Commerce building.

(*See Aids, page* 109)

8 Lanes in Eastern Defense Area Open To Private Aviators

Eight lanes for private flying from points along the Atlantic seaboard to the boundary of the Eastern Vital Defense Area are open. It is now possible for private schools and pilots to make flights out of the restricted zone to practice locations.

Restrictions were lifted by the Eastern Defense Command and the Civil Aeronautics Administration assigned the flight paths. Each is within prescribed boundaries and is three miles in width.

Corridors Approved. — The following flight channels, each to the Defense Area boundary are approved:

From Hybla Valley Airport, Virginia, west over Manassas.

From Blueridge Airport, Virginia, southwest.

From Congressional Airport, Maryland, northeast along U. S. Highway No. 240.

From Solbery-Hunterdon Airport, Readington, New Jersey, northwest.

Seven corridors have been opened in Connecticut, all to the north. They are as follows: from Bethany, Bristol, Danbury, Hartford, Meriden (Follows the Bristol corridor from that city), Monroe, and Waterbury.

Since the likelihood of air invasion is negligible and aircraft "spotting" has been abandoned, there have been many requests from private flying organizations for the lessening or abolition of restrictions on private flying.

Aided by Communications

Many planes unable to find the Pittsburgh field have been brought down safely by the Civil Aeronautics Administration azimuth-indicating receiver on 3105 and 4495 kc installed there.

The service began operation April 9 and the next day landed its first "lost" plane. Between that time and the thirtieth of June fourteen pilots were assisted to landings at Pittsburgh. Calls for help have been of almost daily occurrence and twice during May two planes were landed during two 24-hour periods.

While the calls on Pittsburgh were many none of them had the dramatic element characterizing two in other regions. At Wilkes-Barre, Pa., the lives of five were saved when their plane was guided to a safe landing. The pilot, in praise of the radio operator there, wrote: "Assistance given me proved invaluable and helped save the lives of five men." In Alaska a plane down on the Kobuk river with three passengers sent a "blind" call for help. He was out of fuel and his receiver was not working. Communicator Pringle at Kotzebue, 150 miles from the distressed plane, contacted the pilot of another aircraft which took both fuel and food. The next day rescued and rescuer landed at Kotzebue.

CAA Answers

The CAA Journal, through its Question and Answer Column, will be glad to reply to queries from readers. Address them to Editor, Civil Aeronautics Journal, Reference A250, Civil Aeronautics Administration, Washington 25, D. C. Any publication may use the Question and Answer Column, in part or in its entirety. A credit to the Civil Aeronautics Administration will be appreciated.

Q—(1) What may an ex-service man holding Civil Aeronautics Administration Airport traffic control certificate expect in regard to a post-war job?

(2) How much credit will be given for war experience?

(3) Will preference be given in obtaining a Civil Service job other than that provided by existing law?

(4) Will certified operators who obtained certificates while in the armed forces be required to take a new examination to maintain a certificate in good standing after discharge? W. H. L.

A—(1) Re-employment of veterans is provided for in the Selective Training and Service Act, both federal and private, and Congress has asked the States and their political subdivisions to follow the same method in re-hiring their ex-employees. The legal guarantee made federal employees, if they left a permanent job to enter active military service, is that they will be returned to the job they left or given one of equal status in all respects; provided they were honorably discharged; still qualified to fill the job and made application for re-instatement within forty days after leaving the armed services. Private employers, under the Act, are obliged to re-employ on the prewar status "unless the employer's circumstances have so changed as to make it impossible or unreasonable to do so." Compliance by the States with the Congressional request is, of course, a matter for each to decide.

(2) Experience gained while in the performance of military duty will be an asset, the value of which will be determined by the employer.

(3) Civil Service regulations in regard to preference for veterans have not been changed. Fixed credits of 5 or 10 points are allotted veterans on examination under the auspices of the Commission. Five are given honorably discharged persons and ten to those whose discharges resulted from physical disabilities which do not disqualify them for the positions sought. If a veteran and a civilian seeking the same job have identical examination marks, credit made the veteran of the 5 or 10 points, as the case may be, and the civilian is employed, the agency so acting must give the Commission reasons for doing so. Further, the Commission reserves the right to disclose to the veteran the reasons given by the employing agency.

(4) Holders of traffic control certificates are obliged to take only physical examinations, annually, to keep their credentials valid.

Q—What is the reason for continuing private flying restrictions along the East and West coasts under present conditions, and when will they be lifted? C. E. P.

A—Restrictions are imposed by the Army in the interest of national safety. Advance information on when they may be lifted is not available. Restrictions have been lifted in the Eastern Defense Area and full details are contained in this issue of the Civil Aeronautics Administration Journal on page 104.

Q—I have a private pilot certificate rating. Will I be permitted to fly dual in a ship of greater horsepower than my rating? A. M. W.

A—Civil Air Regulations Part 20, paragraph 20.724 provides: "Two persons may occupy such control seats if each such person is possessed of at least a valid private pilot certificate; provided further, that where more than one passenger is carried for hire, neither control seat shall be occupied by any person other than a properly certified commercial pilot."

(*See Answers, page* 107)

CAA Districts Will Supply Tech. Data

Technical information on a wide variety of aviation questions is made available by the Civil Aeronautics Administration through its 79 District Offices. Sections are established in each by the Aircraft Section of the General Inspection Division of CAA which will maintain complete libraries of information covering all types of aircraft, engines and instruments open to pilots, airport and school operators and others interested who may ask for answers to their problems.

Bulletins, generally those written by manufacturers, covering maintenance, repair and servicing of their products will be available. The file on this information will be revised as new bulletins are issued. A standard system has been installed and inspectors will have a working knowledge of the bulletins.

This service is a logical parallel development of the proposal of the CAA that private aircraft owners be allowed to do routine maintenance and repair work on their planes.

A further reason for this move by the CAA is the desire to decentralize government services. The District Offices are located about the country in proportion to the density of aircraft, and the new information bureaus will make it possible for all persons concerned to get their information near home rather than through Washington. It will benefit the public and will relieve the overloaded condition of the CAA Washington office.

Aircraft, engine and instrument companies have cooperated with the plan, knowing it will relieve the "inquiry" load on their offices, and spread their technical information more widely. Bulletins have been mailed to some District Offices and the entire service is expected to be in full operation by the end of August.

Cargo Glider Trains?

A Missourian, Keith B. Van Zante, of Kansas City, has outlined a transcontinental cargo glider service in a recent application to the Civil Aeronautics Board.

Van Zante would haul mail and express by conventional aircraft and gliders between Los Angeles, California and New York City. His proposed 2590-mile route would connect the intermediate cities of Phoenix, Albuquerque, Kansas City (Mo.), Chicago and Pittsburgh.

Seeks Comments on Non-scheduled Flight

Owners and operators of aircraft which are for public service on a for-hire basis are to have their standing before the Civil Aeronautics Board fixed. The Board has ordered an investigation to determine their rights and privileges under the Civil Aeronautics Act.

Importance of individual air service; transportation of both persons and goods, was emphasized by the local feeder pickup investigation recently completed. It directed attention to the related problem of activities of the non-scheduled operator.

The Board expects the investigation to give to leaders in the field of American aeronautics and all interested persons an opportunity to contribute their accumulated experience so that it may be utilized in determining the nature and extent of any necessary regulations as well as in planning any future development which may appear warranted.

The entire aviation industry, the Administrator of Civil Aeronautics, the Post Office Department, all state aviation bodies, all domestic air carriers, all applicants for transportation certificates, aircraft manufacturers, trade associations, and airport managers have been notified and will have the opportunity to attend public hearing to be held before Examiners of the Board.

Airport Design Manual Made Available by CAA

Because of the demand for facts on airports the CAA has made its "Airport Design Manual" available to the public at 15c a copy. The book can be obtained from the Superintendent of Documents, Government Printing Office, Washington 25, D. C.

Heretofore this manual has only been furnished, on special request, to airport planning officials. With hundreds of communities planning post-war airport expansion, and schools and colleges organizing courses dealing with airport management, the demand has far outstripped the supply.

All of the things that must be considered in creating an airport—site selection, soil, drainage, grading, turf, etc.—are discussed. There's a chapter on maintenance too, and a glossary of terms and a directory of CAA regional offices.

Aircraft Engineering Reports Now Available; Supply Limited

Reports on studies by the Civil Aeronautics Administration's Aircraft and Engineering Division are available in limited numbers to those who have need of them. The supply is limited and distribution must be restricted. Earlier reports were described as Aircraft Airworthiness Section Reports.

Not all of the reports are available. Some are restricted, others confidential and a few are obsolete, but all are listed.

The reports obtainable from the Civil Aeronautics Administration Division of Information and Statistics Service, Department of Commerce Building, Washing 25, D. C. Address your request to Attention A-250. List of reports follows:

No. 1. "Arrangement and Revision of Requirements," dated July, 1939. This is the first of a series of 9 reports dealing with airworthiness and discusses various revisions made to clarify the requirements and assist manufacturers in applying them to their designs.

No. 2. "Unsymmetrical Flight Conditions," dated July, 1939. Discusses the use of rational method of analysis in unsymmetrical flight loading conditions.

No. 3. "Side Load on Boat Seaplanes," dated July, 1939. Covers development of a design condition imposing rolling accelerations likely to be developed in landing with side drift.

No. 4. "Flight Loading Conditions," dated July 1939. Flight loading conditions on the basis of a flight envelope.

No. 5. "Use of Flight Envelope in Strength Analysis," dated July, 1939. (Supplementary to Report No. 4).

No. 6. "Flight Load Factors, Part I—History, Gusts, Large Airplanes," dated July, 1939. Discusses load factor requirements.

No. 7. "Gust Load Factor Principles," dated July, 1939. Supplemental to Report No. 6, simplified presentation of basic gust load factor theories.

No. 8. "Flight Load Factors, Part II—Maneuvering Load Factors," dated August, 1939. Considers possible improvements in the maneuvering load factor requirements for airplanes less than 30,000 lbs. gross weight.

No. 9. "Operation Limits for Commercial Airplanes," dated August, 1939. Discusses flight limitations of commercial airplanes from a strength standpoint.

No. 10. "Load Factor Information for Pilots," dated September, 1939. Presents a simple explanation of the basis on which airplane strength is determined and shows how flight maneuvers should be limited to avoid structural damage.

No. 11. "Loads Imposed by Tail Slides," dated September, 1939. Discusses a special flight condition for maneuvers during which the airplane falls backward.

No. 12. "Hull Water Loading Requirements," dated September, 1939. Nature and distribution of hull bottom pressures.

No. 13. "Correction of Compression Test Results for Material Properties," dated September, 1939. A simple method of correction.

No. 14. "Interpretation of Landing Gear Drop Test Records and the Use of the N.A.C.A. Accelerometer," dated September, 1939. Clarifies certain aspects of landing gear drop tests with particular reference to the use of the N.A.C.A. accelerometer.

No. 15. "Defects in Spruce, Laminating, Splicing and the Use of Substitute Materials in Spars," dated January, 1940.

No. 16. "Aircraft Safety Belts," dated April 1, 1940. (Obsolete).

No. 17. "Summary of Information Pertaining to Gliders," dated May, 1940. (Obsolete).

No. 18. "A Mechanical Method for Determining the Quality of Aircraft Woods," dated July, 1940. Describes the Forest Products Laboratory's toughness testing machine as a means of determining the basic quality of spruce to be used in aircraft construction. Release No. 22 with Safety and Regulations.

No. 19. "Flutter Prevention Measures," dated October, 1940. (Obsolete). Pertinent information from this report has been incorporated in CAM 04.

No. 20. "Information Relative to Ski Testing Procedure," dated December, 1940. Presents information relative to the procedure to be followed in testing skis for approval in accordance with the requirements of CAR 15. With Certificate and Inspection Release No. 32.

No. 21. "Summary of Structural Failures and Defects Reports," dated December, 1940. This summary of airframe structural failures and defects reports was prepared as a guide on where to place special emphasis in work leading to improvements in structural design. With Certificate and Inspection Release No. 23.

No. 22. "Flexure-Torsion Binary Flutter," dated January, 1941. Outlines methods by which critical flutter speed for wings for the flexure-torsion binary case can be rapidly computed. With Certificate and Inspection Release No. 37.

No. 23. "Perpendicular Axes Control Surface Binary Flutter," dated April, 1941. Outlines methods by which not only the critical flutter speeds of control surfaces for the flexure control surface binary case can be very rapidly computed but also the minimum necessary amounts of dynamic balancing can be estimated to obtain the desired degree of flutter prevention. With Certificate and Inspection Release No. 46.

No. 24. "Parallel Axes Control-Surface Binary Flutter," dated September, 1941. Outlines methods by which the critical flutter speeds of wings and tail configurations for the parallel-axes binary modes can be rapidly estimated. With Safety Regulation Release No. 68.

No. 25. Confidential. (Not available for distribution.)

No. 26. "Characteristics of Airplanes Used in the Civilian Pilot Training Secondary Courses," dated March, 1941. Summarizes the replies to a questionnaire regarding characteristics of airplanes used in secondary flight training. With Certificate and Inspection Release No. 42.

No. 27. "Report on Buckling and Separation of Stiffened Plywood Compression Panels," dated January 22, 1943. (Out of Print.)

No. 28. "A Simple Approximate Method of Obtaining the Spanwise Distribution of Lift on Wings," dated August, 1941. (Obsolete.) The methods given in this report have been incorporated in CAM 04.

No. 29. "Rib Loading Conditions for High Angle of Attack," dated January 1, 1942. Discusses proposed revisions to CAM 04 with reference to the distribution of the loads on ribs for the high angle of attack condition. With Safety Regulation Release No. 97.

No. 30. Confidential. (Not available for distribution.)

No. 31. Confidential. (Not available for distribution.)

No. 32. "Proposed Rotorplane Airworthiness," dated Feb. 16, 1943. Presents a first draft of proposed airworthiness requirements for helicopters and autogiros. (Not available for general distribution. Copies available to manufacturers and other interested parties on request to the Aircraft Engineering Division.)

No. 33. Confidential. (Not available for distribution.)

No. 34. "Aircraft Power Plant Fire Protection," dated September 13, 1943. Discusses the design of power plant installations from the standpoint of fire prevention and also the design of fire detection and extinguishing systems. Restricted. (Not available for distribution.)

No. 35. Restricted. (Not available for distribution except to parties entitled to receive restricted documents.)

No. 36. Restricted. (Not available for distribution.)

No. 37. Confidential. (Not available for distribution.)

As you will note, certain Aircraft Engineering Division reports are confidential and restricted and therefore cannot be given general distribution. These reports were prepared for the services.

In addition to the A.E.D. report series, the Division has assisted in the preparation of several Army-Navy-Civil publications. These are listed below:

ANC-1 (1) "Spanwise Air-Load Distribution." Available from G.P.O. for 60c per copy.

ANC-1 (2) "Chordwise Air-Load Distribution." Available from A-250.

ANC-2 "Ground Loads Handbook." Available from G.P.O. for 10c per copy.

ANC-5 "Strength of Aircraft Elements." Available from G.P.O. for 30c per copy.

ANC-17 "Plastics for Aircraft." Available from G.P.O. for 40c per copy.

ANC-19.

"Wood Aircraft Inspection and Fabrication." Available from G.P.O. for $1.00 per copy.

Acquisition of TWA By Hughes Tool Co. Is Approved by CAB

Application of the Hughes Tool Company, Houston, Texas, for the acquisition of Transcontinental and Western Air, Inc. is approved by the Civil Aeronautics Board. Action was taken by the Board under authority of Section 408 (a) (5) of the Civil Aeronautics Act.

Hughes Tool is a Delaware corporation, all the stock of which is owned by Howard R. Hughes. Its principal business is the manufacture of equipment and supplies for the oil well drilling industry.

Bought First Shares in 39.—Hughes Tool first became interested in TWA at the solicitation of the president of TWA, a personal friend of Howard R. Hughes. In March 1939, the first purchase of stock, amounting to 600 shares, was made. By the end of that year, Hughes Tool was the owner of 157,700 shares of common stock of TWA. This amount had grown to more than 400,000 shares, or 42.1 per cent of the then outstanding total at the end of 1940. At the end of 1942, Hughes Tool owned 440,050 shares or 45.6 per cent of a total of 965,173 shares outstanding. All of this stock except 119,154 shares purchased on March 2, 1940, directly from the TWA treasury, was acquired through open market or brokerage transactions. The total investment of Hughes Tool in the stock of TWA is approximately $5,505,000.

Board Comments.—Under the present and contemplated operations of Hughes Tool no adverse effect upon the public interest can be foreseen. The firm is not now engaged in and has no plans contemplating production of aircraft, aircraft parts, or facilities for use in commercial air transportation. So far as the possibility of TWA acquiring from the applicant aircraft, which the applicant is obligated to purchase under existing agreements is concerned, the price is firmly established so as not to exceed costs, and in view of what might be referred to as the paternalistic attitude of Hughes Tool up to the present, the likelihood that TWA might be forced to purchase more than the economic operations of TWA require is remote.

Remembering that the interest of applicant in the air carrier had its inception in an effort to be helpful in the consummation of plans conceived and initiated by the air carrier itself, it is not inconsistent with the public interest that the relationship continue, but because of the possibilities resting therein, it is proper that the Board in observance of the obligations imposed upon it by the Act insure against any temptation which may later come to the applicant to take advantage of the relationship to its own profit and to the detriment of the public interest by granting its approval subject to such reasonable conditions as will enable it in the future to adequately protect the public interest.

Year's Crash Record

A comparative study of aircraft accidents of the calendar years of 1942 and 1943, made by the Accident Analysis Section of the Civil Aeronautics Board shows an encouraging decrease in the number of crashes due to carelessness and poor technique. Bad judgment, however, continued a major contributing factor to accidents with power plant and structural failures standing second and third as causes.

Landing accidents constituted almost 40 percent of the 1943 total of 5,428 and while the number, in relation to the total, is large, the resulting injury to individuals and damage to aircraft still stands at a low ratio to accidents of other kinds. The Board disclosed that a detailed study of landing crashes shows poor technique as the cause of approximately two-thirds of them.

While the number of propeller accidents in 1943 exceeded that of 1942, their seriousness showed a decrease. In the latter year, more than two-thirds of propeller accidents cause either fatal or grave injuries, and in 1943 less than half of them were serious. Functional failure of structure during flight resulted in thirteen fatalities and caused serious injury in five instances, the Board reported. Wing assemblies and flight control systems contributed most largely to these accidents.

Mid-air collisions caused thirty-one accidents, and almost half resulted in fatal or grave injury to individuals and destruction of the planes involved. In two instances military fliers were considered at fault, and in one a control tower operator was held blameworthy.

Violation of Civil Air Regulations was shown to be a potent factor in the 1943 accidents. Disregard of them is noted in 287 accidents and the most prominent infractions in order of frequency were: low flying, acrobatic violations, laxity of following instruction regarding physical examination, carrying passengers with dual controls connected and student pilots carrying passengers.

As a remedial measure, the Board report suggests "adequate discipline and strict operational management."

Answers

(*Continued from page* 105)

Q—What is considered an adequate field for takeoff and landing for craft up to 200 horsepower; how many runways are necessary for a private flying field and what are the prime land requisites for such a field? C. M. G.

A—The Civil Aeronautics Administration Airport Design Manual fixes runway lengths for fields adapted to private flying at from 1,800 to 2,700 feet, 300 feet in width. There are two runways in fields of this design. Land should be smooth, well drained and sufficiently firm to permit safe operation of aircraft under all ordinary weather conditions.

Places Where WTS Planes Are Offered On Sealed-bid Basis

Airplanes used by the Civil Aeronautics Administration in its War Training Service program and those declared surplus by the armed forces are being sold on sealed bids in 30 places all over the United States. They are offered on a "where is" and "as is" basis, and prospective bidders are urged by the CAA to avail themselves of the advice of Administration representatives who are at each of the sales points.

Manufacturers' prices on the planes range from $1,400 to $10,000, but these figures indicate the kind of plane rather than its value as offered. The following types are listed: L-2, L-3, L-9, PT-19, PT-22 are 2-place; UC-72, UC-81 are 4 and 5-place and UC-61, UC-78 are 4-place.

The planes may be inspected at the following places where bids will be received:

Albany Aircraft Company, Albany, N. Y.; Jennings Brothers Air Service, Inc., North Grafton, Mass.; Thor Solberg, White House, N. J.; Cannon Aircraft Sales and Service, Inc., Charlotte, N. C.; Chapman Air Service, New Orleans, La.

J. D. Gillespie, Nashville, Tenn.; Racine Flying Service, Inc., Racine, Wis.; Robert Slamp Flying Service, Lansing, Ill.; Brayton Flying Service, Inc., St. Louis, Mo.; Central Aviation Corporation, Omaha, Nebr.

Des Moines Flying Service, Des Moines, Iowa; Harte Flying Service, Wichita, Kan.; Ong Aircraft Corporation, Kansas City, Mo.; Thompson Flying Service, Salt Lake City, Utah; Ludwig School of Aviation, St. Petersburg, Fla.

Akron Airways, Inc., Akron, Ohio; Hughes Flying Service, Lansing, Mich.; Lysdale Flying Service, Minneapolis, Minn.; Aviation Enterprise, Ltd., Houston, Tex.; Cincinnati Aircraft Service, Cincinnati, Ohio.

Dakota Aviation Company, Huron, S. Dak.; Aviation Activities Company, Concord, Calif., (mail contract to P. O. Box 215, Alturas, Calif.); Great Plains Aviation Company, Inc., Dupont, Colo.; Morrison Flying Service, Helena, Mont.; Cutter-Car Flying Service, Albuquerque, N. M.

Heasley Flying Service, Rosemead, Calif.; Hilsen Aero Service, Spokane, Wash.; Southwest Airways, Inc., Phoenix, Ariz.; Ashburn Flying Service, Inc., Alexandria, Va.; A. G. Becker, d/b/a Bettis Airport, Pittsburgh, Pa.

Tower Operators Praised

"The good work of your Chicago Tower Operators was instrumental in the successful completion of our recent training program," writes Fred R. Bailey, Chief Pilot, American Airlines to E. J. Kampwirth who is in charge of the tower.

Domestic Air Carrier Statistics

Operations for July 1944

Operator and routes	Revenue miles flown	Revenue passengers carried[1]	Revenue passenger miles flown	Express carried (pounds)	Express pound-miles flown	Passenger seat-miles flown	Revenue passenger load factor (percent)
All American Aviation, Inc., Pittsburgh-Huntington, Jamestown, Williamsport, Harrisburg, Washington—Total	**110,016**	**0**	**0**	**15,111**	**2,326,277**	**0**	.....
American Airlines, Inc.—Total	**3,034,804**	**88,575**	**53,185,994**	**1,990,090**	**870,661,044**	**58,255,651**	**91.30**
Dallas-Los Angeles	1,033,632	21,301	18,486,879	140,888	148,518,861	19,985,716	92.50
New York-Chicago	437,513	20,269	7,577,408	747,877	324,048,916	8,211,370	92.28
Boston-New York	190,848	19,629	3,412,823	400,936	60,040,725	3,870,753	88.17
Syracuse-Cleveland	31,994	2,703	426,726	87,193	17,041,575	651,146	65.53
Cleveland-Nashville	63,441	5,005	1,252,019	78,340	21,061,476	1,327,979	94.28
New York-Fort Worth	839,144	25,581	14,233,475	326,208	200,017,125	15,513,847	91.75
Washington-Chicago	171,248	7,210	3,048,809	148,892	60,800,484	3,310,734	92.09
Chicago-Fort Worth	120,416	5,122	2,309,396	43,781	23,751,675	2,559,497	90.23
Buffalo-Toronto	4,712	1,241	94,316	3,124	237,424	98,724	95.53
El Paso or Fort Worth-Mexico City	141,856	2,305	2,344,143	12,851	15,142,783	2,725,885	86.00
Braniff Airways, Inc.—Total	**488,233**	**21,371**	**9,066,495**	**121,398**	**57,247,502**	**9,905,294**	**91.53**
Chicago-Dallas	292,119	10,243	5,483,754	79,313	46,763,336	5,811,339	94.36
Denver-Brownsville	174,548	11,476	3,246,815	38,877	10,001,881	3,650,501	88.94
San Antonio-Laredo	21,566	2,025	335,926	3,208	482,285	443,454	75.75
Chicago & Southern Air Lines, Inc.—Total	**216,854**	**8,693**	**4,028,061**	**79,103**	**32,605,216**	**4,546,876**	**88.59**
Chicago-New Orleans	183,642	7,889	3,449,869	67,624	27,705,888	3,849,424	89.62
Memphis-Houston	33,212	1,706	578,192	11,479	4,899,328	697,452	82.90
Continental Air Lines, Inc.—Total	**236,342**	**7,271**	**2,512,571**	**18,993**	**6,515,094**	**2,743,226**	**91.59**
Denver-El Paso-San Antonio	162,793	4,953	1,692,122	13,773	5,133,005	1,877,409	90.13
Denver-Tulsa	39,474	1,956	438,124	3,116	679,988	467,264	93.76
Denver-Kansas City	34,075	842	382,325	2,104	702,101	398,553	95.93
Delta Air Corporation—Total	**293,511**	**14,522**	**5,669,210**	**74,104**	**26,627,092**	**6,139,452**	**92.34**
Charleston or Savannah-Fort Worth	246,271	11,717	4,706,298	43,543	17,373,790	5,151,072	91.37
Atlanta-Cincinnati	47,240	3,007	962,912	30,561	9,253,302	988,380	97.42
Eastern Air Lines, Inc.—Total	**1,519,228**	**40,528**	**21,911,544**	**407,518**	**257,450,754**	**25,320,371**	**86.54**
New York-San Antonio or Brownsville	518,244	15,110	8,339,222	139,310	102,905,665	9,463,294	88.12
New York-Miami	591,706	16,733	8,365,055	185,858	112,437,798	9,871,539	84.74
Chicago-Jacksonville	294,748	8,287	3,538,542	49,529	25,715,520	3,731,146	94.84
Atlanta-Tampa	41,974	1,839	593,205	5,217	2,820,348	878,590	67.52
Washington-St. Louis	72,556	2,288	1,075,520	27,604	13,571,423	1,375,802	78.17
Inland Air Lines, Inc.—Total	**126,146**	**2,322**	**698,396**	**7,998**	**1,349,674**	**1,030,958**	**67.74**
Denver-Great Falls	92,940	2,322	698,396	7,851	1,306,147	1,030,958	67.74
Cheyenne-Huron	33,206	0	0	147	43,527	0	.....
Mid-Continent Airlines, Inc.—Total	**209,178**	**7,624**	**2,155,237**	**20,949**	**6,578,085**	**2,652,464**	**81.25**
Minneapolis-Tulsa	151,828	5,738	1,574,384	16,491	5,385,769	1,918,540	82.06
Minneapolis-Des Moines-St. Louis or Kansas City	57,350	1,966	580,853	4,458	1,192,316	733,924	79.14
National Airlines, Inc.—Total	**265,517**	**9,806**	**3,252,062**	**23,888**	**7,982,760**	**3,684,498**	**88.26**
Jacksonville-Key West via Miami	133,486	6,607	1,540,397	8,444	2,143,059	1,856,362	82.98
Jacksonville-New Orleans	132,031	4,594	1,711,665	15,444	5,839,701	1,828,136	93.63
Northeast Airlines, Inc., Boston-Presque Isle and Moncton—Total	**89,662**	**5,472**	**1,394,418**	**11,427**	**1,849,197**	**1,874,166**	**74.40**
Northwest Airlines, Inc.—Total	**641,776**	**17,442**	**11,471,223**	**176,800**	**93,049,535**	**12,774,611**	**89.80**
Chicago-Twin Cities-Seattle; Fargo-Winnipeg	633,424	17,442	11,471,223	176,145	92,955,215	12,774,611	89.80
Minneapolis-Duluth	8,352	0	0	655	94,320	0	.....
Pennsylvania-Central Airlines Corporation—Total	**517,654**	**41,919**	**9,275,551**	**444,076**	**89,694,272**	**10,804,297**	**85.85**
Norfolk-Detroit	388,185	34,921	7,124,682	359,315	68,184,711	8,090,209	88.07
Detroit-Milwaukee or Chicago	36,345	4,189	679,662	42,197	7,747,762	761,930	89.20
Pittsburgh-Buffalo	13,516	1,282	249,084	9,057	1,282,374	283,476	87.87
Pittsburgh-Birmingham	79,608	3,464	1,222,123	33,507	12,479,425	1,668,682	73.24
Transcontinental & Western Air, Inc.—Total	**2,149,550**	**41,579**	**36,508,858**	**1,394,580**	**761,546,605**	**38,923,583**	**93.80**
New York-Los Angeles	1,437,251	34,255	24,005,564	781,835	513,827,507	26,024,250	94.55
Dayton-Chicago	52,624	3,790	873,453	105,372	23,163,404	1,109,701	78.71
Boulder City-San Francisco	120,077	5,554	2,287,574	40,521	18,768,766	2,440,731	93.72
Kansas City-Pittsburgh via Chicago	417,726	12,207	6,632,290	363,094	185,905,023	6,898,663	96.14
St. Louis-Detroit via Cincinnati and Dayton	70,458	5,243	1,170,482	85,329	15,033,510	1,426,942	82.03
Washington-Dayton via Columbus	51,414	2,817	939,495	18,429	4,848,395	1,023,296	91.81
United Air Lines, Inc.—Total	**2,601,954**	**59,199**	**42,018,325**	**893,327**	**730,995,148**	**43,335,259**	**96.96**
New York-San Francisco	1,964,700	29,989	29,650,769	734,465	657,005,748	30,547,514	97.06
Salt Lake City-Seattle	149,432	5,040	2,925,824	46,695	29,824,572	3,149,044	92.91
Seattle-San Diego	424,018	21,035	8,198,044	97,521	38,849,131	8,326,239	98.46
Seattle-Vancouver	11,008	1,664	222,440	1,659	198,819	230,144	96.65
Washington-Toledo	52,796	1,471	1,021,248	12,987	5,116,878	1,082,318	94.36
Western Air Lines, Inc.—Total	**269,162**	**11,306**	**5,341,585**	**76,340**	**37,754,855**	**5,697,225**	**93.76**
San Diego-Salt Lake City	165,254	6,342	3,367,997	63,451	33,499,684	3,498,497	96.27
Salt Lake City-Great Falls	31,248	1,432	603,928	1,757	529,432	680,803	88.71
Great Falls-Lethbridge	10,230	676	95,584	267	35,189	218,073	43.83
Los Angeles-San Francisco	62,430	3,518	1,274,076	10,865	3,690,550	1,299,852	98.02
Total	**12,769,587**	**377,629**	**208,489,530**	**5,755,702**	**2,984,233,110**	**227,687,931**	**91.57**
Colonial Airlines, Inc., New-York-Montreal—Total	**88,318**	**5,198**	**1,591,018**	**34,901**	**12,313,392**	**1,799,470**	**88.42**
Hawaiian Airlines, Ltd., Honolulu-Hilo and Port Allen—Total	**87,730**	**10,434**	**1,489,070**	**662,735**	**98,354,147**	**1,566,216**	**95.07**
Grand Total	**12,945,635**	**393,261**	**211,569,618**	**6,453,338**	**3,094,900,649**	**231,053,617**	**91.57**

[1] The total passengers carried for each airline is an unduplicated figure with the exception of United whose unduplicated figure was not available.

Operations for the first 7 months of 1944 compared with the same period of 1943

Operator	Revenue miles flown January–July		Revenue passengers carried (unduplicated)[1] January–July		Revenue passenger miles flown January–July	
	1944	1943	1944	1943	1944	1943
All American Aviation, Inc.	651,811	592,504	0	0	0	0
American Airlines, Inc.	17,805,241	14,992,699	480,019	451,545	292,311,564	247,761,607
Braniff Airways, Inc.	2,665,632	2,194,764	109,275	82,781	46,524,213	34,982,543
Chicago & Southern Air Lines, Inc.	1,316,198	1,248,261	49,984	46,092	22,864,084	19,476,863
Continental Air Lines, Inc.	1,231,341	878,313	34,216	26,703	11,750,486	8,536,066
Delta Air Corporation	1,727,824	1,179,354	82,347	56,528	32,745,696	22,044,739
Eastern Air Lines, Inc.	8,941,196	7,617,148	239,249	210,670	136,689,921	121,795,531
Inland Air Lines, Inc.	605,573	472,935	10,045	6,268	3,230,472	2,140,406
Mid-Continent Airlines, Inc.	1,254,604	673,965	40,234	15,335	11,482,886	4,219,017
National Airlines, Inc.	1,701,807	943,580	62,306	32,403	20,430,999	11,349,920
Northeast Airlines, Inc.	560,121	363,290	27,450	17,656	6,651,120	4,367,003
Northwest Airlines, Inc.	3,512,728	2,188,422	83,385	45,285	55,877,691	28,962,592
Pennsylvania-Central Airlines Corporation	2,376,605	1,617,721	184,976	120,307	41,207,943	26,922,588
Transcontinental & Western Air, Inc.	11,331,406	8,995,809	205,669	179,515	177,626,249	128,796,221
United Air Lines, Inc.	15,677,245	12,071,925	296,041	235,041	243,766,690	191,891,702
Western Air Lines, Inc.	1,561,888	1,083,186	58,655	39,542	28,131,652	16,732,031
Total	72,921,220	57,113,876	1,963,851	1,565,671	1,131,291,666	869,978,829
Index (1943 = 100)	127.68	100.00	126.27	100.00	130.04	100.00
Colonial Airlines, Inc.	481,040	374,558	26,664	19,547	8,254,296	5,651,844
Hawaiian Airlines, Ltd.	525,223	544,820	60,717	65,208	8,668,255	6,278,794
Grand Total	73,927,483	58,033,254	2,051,232	1,650,426	1,148,214,217	881,909,467
Index (1943 = 100)	127.39	100.00	125.08	100.00	130.20	100.00

Operator	Express carried (pounds) January–July		Express pound-miles flown January–July		Passenger seat-miles flown January–July		Revenue passenger load factor (percent) January–July	
	1944	1943	1944	1943	1944	1943	1944	1943
All American Aviation, Inc.	68,510	74,815	10,012,671	9,775,170	0	0	.....	.....
American Airlines, Inc.	11,698,534	11,285,239	5,412,187,095	5,370,412,648	326,506,540	286,258,148	89.53	85.55
Braniff Airways, Inc.	641,067	776,515	293,630,407	381,341,143	50,758,687	38,457,870	91.66	90.96
Chicago & Southern Air Lines, Inc.	557,902	466,820	225,340,015	209,371,060	26,911,137	23,916,377	84.96	81.44
Continental Air Lines, Inc.	99,346	68,870	40,241,978	24,587,602	13,777,095	9,945,008	85.29	85.83
Delta Air Corporation	509,610	326,300	189,205,584	124,448,594	35,751,301	24,725,620	91.59	89.16
Eastern Air Lines, Inc.	2,648,268	2,502,266	1,745,863,808	1,564,823,567	157,585,771	142,185,854	86.74	85.84
Inland Air Lines, Inc.	21,079	16,016	4,046,563	3,839,847	4,664,274	3,389,125	69.26	63.16
Mid-Continent Airlines, Inc.	121,735	75,609	32,447,709	17,395,906	15,520,866	6,733,081	73.98	62.66
National Airlines, Inc.	245,444	187,173	84,640,607	47,189,513	23,413,880	13,137,758	87.26	86.39
Northeast Airlines, Inc.	67,050	45,153	13,297,279	9,716,929	11,667,854	7,621,337	57.00	57.30
Northwest Airlines, Inc.	1,129,107	824,563	591,598,104	553,936,407	65,779,731	35,648,132	84.95	81.25
Pennsylvania-Central Airlines Corporation	2,445,699	2,271,840	461,419,461	419,272,538	49,509,626	33,530,084	83.23	80.29
Transcontinental & Western Air, Inc.	7,124,396	5,831,901	3,731,557,816	3,457,681,430	195,375,867	146,807,867	90.92	87.73
United Air Lines, Inc.	5,821,892	5,747,789	4,417,395,760	4,448,028,816	254,125,513	212,590,016	95.92	90.26
Western Air Lines, Inc.	519,080	549,251	265,867,535	244,578,697	32,009,069	19,844,919	87.89	84.31
Total	33,718,719	31,050,120	17,518,752,392	16,886,399,867	1,263,357,211	1,004,791,196	89.55	86.58
Index (1943 = 100)	108.59	100.00	103.74	100.00	125.73	100.00	103.43	100.00
Colonial Airlines, Inc.	126,343	108,643	40,128,882	30,466,461	9,981,254	7,343,949	82.70	76.96
Hawaiian Airlines, Ltd.	4,111,495	3,331,893	633,864,086	534,280,399	9,218,880	9,935,360	94.03	63.20
Grand Total	37,956,557	34,490,656	18,192,745,360	17,451,146,727	1,282,557,345	1,022,070,505	89.53	86.29
Index (1943 = 100)	110.05	100.00	104.25	100.00	125.49	100.00	103.75	100.00

	January	February	March	April	May	June	July	Total
Passengers carried (unduplicated) (total revenue and non-revenue)[1]:								
16 domestic airlines	242,683	221,011	251,445	272,273	311,829	326,878	384,037	2,010,156
Total airlines	255,001	231,809	262,347	283,899	324,275	340,961	399,739	2,098,031
Passenger miles flown (total revenue and non-revenue):								
16 domestic airlines	141,474,106	125,088,611	142,834,165	155,159,351	181,038,023	193,288,705	211,703,804	1,150,586,765
Total airlines	143,727,253	127,107,076	144,884,424	157,414,978	183,563,374	196,130,812	214,800,861	1,167,628,778

[1] Preliminary. Due to the delay in reporting by some companies, these figures are subject to revision in subsequent publications.

NAA Wants Gas Tax for Aviation

Taxation of aviation gasoline by state governments with proceeds earmarked for aviation development is advocated by the National Aeronautical Association. The policy was adopted by the governors following a referendum vote by the board of directors.

Aids

(*Continued from page* 104)

The training aids shown include engine, flight, navigation, instruments, weather maps; sectional charts and a combination map with moving airplane and phonograph which simulates radio contacts on a flight from New York City to Washington. Air services and several manufacturers cooperated in making possible the collection of teaching aids.

Flight Examination Taken by 30; 26 Pass

Twenty-six of a class of thirty which took the CAA Flight Information Ground School course, were graduated. The showing is considered very good as the examination was difficult.

Three members of the class were from the U. S. Coast and Geodetic Survey.

OFFICIAL ACTIONS . . . Civil Aeronautical Board

ORDERS 3020 THROUGH 3073

Airline Orders

Service

No. 3020 denies the petition of Southair, Inc., to intervene in the applications of 5 airlines for certificates. (July 22)

No. 3024 temporarily exempts Pan-Am from the provisions of Sec. 401 of the Civil Aeronautics Act insofar as they might prevent Pan-Am from substituting Santiago, Cuba, for Antilla, Cuba as an intermediate point between Miami, Fla., and Buenos Aires, Argentina. (July 24)

No. 3026 grants the petitions of American, Continental, TWA, UAL and the Department of Justice to intervene in the Rocky Mountain Case—docket 152 et al and denies the petitions of Mid-Continent and Northwest. (July 24)

No. 3029 permits Inland Air Lines to withdraw its petition for an order fixing the rate of compensation for mail transportation over Routes Nos. 28 and 35. (July 25)

No. 3030 institutes an investigation concerning non-scheduled air services. (July 26)

No. 3031 orders that the effective period of the temporary permit held by Royal Dutch Air Lines be extended for 3 months from July 31. (July 26)

No. 3033 orders that the effective period of the temporarily permit held by Expreso Aereo Inter-Americano, S. A., be extended for 3 months from July 31. (July 28)

No. 3034 rescinds Order No. 1759 insofar as it authorized temporary suspension of service by Penn-Central to and from Chicago, Ill. (July 29)

No. 3035 dismisses the investigation, instituted by order No. 2719, concerning conditions surrounding the use of the Philadelphia Municipal Airport for transport operations. The Board advised the President, in connection with this investigation, that restoration of air service to Philadelphia was important enough to require spending Federal funds to make the Northeast airport adequate for airline operation. The money was made available and this airport will be suitable for the operation of commercial aircraft soon. (Aug. 1)

No. 3036 permits EAL to inaugurate non-stop service on August 1 between Columbus, Ga., and Montgomery, Ala. (Aug. 1)

No. 3037 permits National Airlines to inaugurate non-stop service on August 1 between West Palm Beach and Tampa, Fla. (Aug. 1)

No. 3038 permits Penn-Central to inaugurate non-stop service on August 1 between Muskegon and Detroit, Mich. (Aug. 1)

No. 3039 grants the South Carolina Aeronautics Commission and the City of Charleston, S. C., permission to intervene in applications for certificates authorizing additional air service to Mexico, Central and South America, and the Caribbean—Docket 525 et al. (Aug. 1)

No. 3040 grants the Board of County Commissioners of Pinellas County, Fla., permission to intervene in Docket 525 et al. (Aug. 1)

No. 3041 terminates temporary exemption granted to Alaska Star Airlines, Inc. (now known as Alaska Airlines, Inc.) and Cordova Air Service, Inc., by orders 2257 and 2956. (Aug. 2)

No. 3044 grants EAL permission to intervene in the applications of 9 airlines for certificates—Docket 629 et al. (Aug. 4)

No. 3046 consolidates applications of Western Air Lines and Western Washington Airways with those in the West Coast Case. (Aug. 5)

No. 3047 denies American Airlines' request that its application be consolidated into the West Coast Case. (Aug. 5)

No. 3048 fixes the rates of compensation for mail transportation by Continental over routes 29, 43, and 60. (Issued with an opinion – Aug. 1)

No. 3049 dismisses W. R. Grace and Co's petition re the alteration, amendment and modification of PANAGRA's certificate. (Aug. 5)

No. 3050 amends TWA's certificate so as to include Terre Haute, Ind., as an intermediate point between Indianapolis, Ind., and St. Louis, Mo.; extends Chicago and Southern's Houston–Memphis route to the new terminal point Detroit, Mich., via the intermediate points Paducah, Ky., Evansville, Indianapolis, Anderson–Muncie–New Castle, Marion, Fort Wayne, Ind., and Toledo, Ohio; denies other applications in the same proceeding of TWA, Chicago and Southern, EAL, American, Mid-Continent, and United. (Issued with an opinion—Aug. 3)

No. 3052 denies the petition of the City of Little Rock, Ark., to intervene in the applications of 5 airlines for certificates. (Aug. 8)

No. 3055 grants Catalina Air Transport's petition to intervene in the West Coast Case. (Aug. 8)

No. 3058 dismisses the application of Caribbean-Atlantic Airlines from the Latin American proceeding—Docket No. 1153. (Aug. 8)

No. 3059 dismisses the application of The Dayton Co. for a certificate. (Aug. 8)

No. 3060 grants the application of The Port of Portland, Oreg., for permission to intervene in the applications of 7 companies for certificates. (Aug. 10)

No. 3062 severs and assigns new dockets to certain portions of the applications of various companies for additional air transportation service, principally in Oklahoma and Texas, and consolidates 42 applications into one proceeding for hearing—Docket 337 et al. (Aug. 10)

No. 3064 dismisses the application of Edward G. Bern for a certificate. (Aug. 11)

3065 dismisses applications of Automatic Air Mail, Inc., for a certificate. (Aug. 11)

No. 3066 vacates order No. 2702; continues Pan-Am's temporary certificate insofar as it authorizes service between Monrovia, Liberia, and Leopoldville, Belgian Congo. (Aug. 12)

No. 3068 grants the Department of Justice permission to intervene in the West Coast Case. (Aug. 17)

No. 3069 dismisses the application of Interstate Airlines, Inc., from the West Coast Case. (Aug. 17)

No. 3070 consolidates applications proposing air transportation services in the New England States into one proceeding—Docket No. 399 et al. (Aug. 18)

No. 3071 grants UAL and the State of Rhode Island permission to intervene in applications for certificates—Docket 399 et al. (Aug. 18)

Miscellaneous

No. 3028 permits United States Lines Co. to intervene in the proceeding concerning American Export Lines application to divest itself of control of American Export Airlines. (July 25)

No. 3032 approves an agreement by and between Pan-Am and Braniff relating to the air conditioning of Braniff's planes. (July 26)

No. 3045 dismisses application of United Air Lines, Inc., and United Air Lines Victory Corp. for approval of the acquisition of control of the latter by United Air Lines, Inc. (Aug. 4)

No. 3051 modifies order No. 2630 by suspending the provision requiring National Airlines to file special monthly reports on the traffic to and from Key West, Fla. (Aug. 8)

No. 3053 orders withholding from public disclosure until further order of the Board, certain evidence introduced in the proceeding concerning American Export Lines' application to divest itself of control of American Export Airlines. The evidence contains secret information affecting national defense. (Aug. 8)

No. 3056 approves an agreement by and between UAL and Braniff relating to refilling of Braniff's oxygen bottles by United at Denver Municipal Airport, Colo. (Aug. 8)

No. 3057 approves an agreement by and between Western and Inland relating to the leasing of one Stinson airplane by Western to Inland. (Aug. 8)

No. 3063 approves purchase of Mayflower Airlines by Northeast subject to certain conditions. (Supplemental opinion and order—Aug. 7)

Airman Orders

Suspensions

No. 3042 suspends Jean E. Greenham's private certificate for 30 days because he flew in instrument weather and committed other violations of the Civil Air Regulations. (Aug. 1)

No. 3054 suspends Edward E. Drapela's mechanic certificate for 30 days because he signed a periodic inspection report for an airplane but failed to enter the results of the inspection in the aircraft's logbook and committed other violations of the Civil Air Regulations. (Aug. 8)

No. 3072 denies Pierce P. O'Carroll's petition for reconsideration of the suspension of his commercial certificate. (Aug. 15)

No. 3073 amends order 2979 by commencing the suspension date of Pierce P. O'Carroll's commercial certificate on August 28—to be in effect for 90 days. (Aug. 17)

Revocations

No. 3021 revokes Willie M. Wall's student certificate because he carried a passenger and committed other violations of the Civil Air Regulations. (July 24)

No. 3022 revokes the mechanic certificate with aircraft mechanic and engine ratings of John O. Ballard because he signed a periodic inspection report approving a plane as airworthy when it was not and committed other violations of the Civil Air Regulations. (July 24)

No. 3023 cancels the O-8400 hp rating on Everett C. Winings commercial certificate and orders that he be issued only such hp rating as he is legally entitled to hold. (July 24)

No. 3067 revokes Carl W. Poston's student certificate because he used improper means in attempting to prepare for and successfully complete a commercial pilot written exam. (Aug. 15)

Miscellaneous

No. 3025 provides that Aaron H. Mullinax who holds a commercial certificate shall not pilot aircraft for hire until he passes the required flight test. Mullinax flew an overloaded plane. (July 19)

No. 3027 dismisses the Administrator's complaint which alleged that Chester R. Dickson was not qualified to hold a commercial certificate. (July 25)

No. 3043 dismisses the Administrator's complaint which alleged that Floyd F. Stevens, who holds a commercial certificate, taxied an airplane down a runway at the Pueblo, Colo., Municipal Airport while an airliner was landing. (Aug. 1)

No. 3061 reopens the proceeding for additional evidence concerning Stacha L. Burton who holds a parachute technician certificate. (Aug. 10)

Regulations

REG. 315.....*Effective Aug. 1, 1944*

Any first pilot listed in Chicago and Southern Air Lines, Inc., air carrier operating certificate on January 1, 1944, as competent to operate aircraft in scheduled air transportation between Chicago and Springfield, Ill., may pilot aircraft under contact weather conditions in scheduled air transportation for said carrier into and out of the Peoria Airport, Peoria, Ill., upon furnishing evidence to the Administrator that the pilot is thoroughly familiar with the form and condition of the airport and with the location and nature of any obstructions in the vicinity.

Any first pilot listed in Chicago and Southern Air Lines, Inc., air carrier operating certificate on January 1, 1944, as competent to operate aircraft in scheduled air transportation between Memphis, Tenn., and Jackson, Miss., may pilot aircraft in scheduled air transportation for said carrier into and out of the Greenwood Airport, Greenwood, Miss., upon furnishing evidence to the Administrator that the pilot is thoroughly familiar with the form and condition of the airport and with the location and nature of any obstructions in the vicinity.

REG. 316.....*Effective July 22, 1944*

Section 202.5 of the Economic Regulations—Submission of Audit Reports Prepared by Public Accountants.

(a) Whenever any air carrier shall have caused an annual audit of its books, records and accounts to be made by public accountants, such air carrier shall file with the Board a special report consisting of a true and complete copy of the audit report submitted by public accountants, including all schedules, exhibits

and certifications included in or attached to such report. Such a report shall be filed in duplicate with the Board within 15 days after the public accountants have submitted their report to the air carriers, except that no such special report is required to be filed until 30 days after the effective date of this regulation. This section shall apply to all annual audit reports which may have been submitted to any air carrier on or after January 1, 1944.

(b) The special report required to be filed by paragraph (a) hereof shall be withheld from public disclosure, until further order of the Board, if such treatment is requested by the air carrier at the time of filing.

(c) This regulation shall become effective July 22, 1944.

REG. 317.....*Effective Aug. 15, 1944*

Any first pilot listed in Northeast Airlines, Inc., operating certificate on July 1, 1944, who was listed in Northeast Airlines operating certificate on May 31, 1942, as qualified to operate in scheduled air transportation between Boston, Mass., and Montreal, Province of Quebec, Canada, via Manchester and Concord, N. H., and Montpelier and Burlington, Vt., will be deemed competent to pilot aircraft in scheduled air transportation on this route upon completion of two one-way trips one of which must be made between one hour after sunset and one hour before sunrise. Each pilot must have made at least one landing at each scheduled stop on the route.

REG. 318.....*Effective Aug. 1, 1944*

Any person who is at least 15 years of age and who is listed in the records of the Institute of Aviation Psychology National Research Council, University of Tennessee, Knoxville, Tenn., as a trainee in an experimental course of specialized flight instruction may be issued a limited student pilot certificate subject to the following provisions:

(a) such person shall adhere to all the Civil Air Regulations except as above provided;

(b) such person shall pilot aircraft in solo flight only when and to the extent authorized by the Institute of Aviation Psychology-National Research Council, University of Tennessee.

This regulation shall terminate on June 15, 1945.

REG. 319.....*Effective Aug. 8, 1944*

When an airport is approved as a scheduled stop on an established route, any first pilot listed in the air carrier operating certificate who has served regularly as such on the route involved for the immediately preceding 6-month period, may pilot aircraft into and out of such airport under conditions specified by the Administrator upon furnishing evidence that he is thoroughly familiar with the form and condition of the airport and with the location and nature of any obstructions in the vicinity.

This regulation shall terminate on October 8, 1944.

AMDT. 20–1.....*Effective July 27, 1944*

20.31 **Duration.** A pilot certificate shall be of 90 days' duration unless the holder thereof is otherwise notified by the Administrator within such period, and unless so notified shall thereafter continue in effect until otherwise specified by the Board. The certificate shall be automatically canceled at any time by the issuance of a new certificate of a different grade.

Airmail Route 1st Business Before CAB Alaska Office

The first business to come before the Civil Aeronautics Board's Alaska Office at Fairbanks was application for an airmail route between Fairbanks and Kodiak by way of Anchorage. The request for a permanent certificate of public convenience and necessity was filed by Alaska Airlines, Inc., and Woodley Airways.

Hearing date was set for August 15 before the newly appointed CAB examiners Raymond W. Stough and Robert A. Bartoo.

AIR REGULATIONS . . . As of September 1, 1944

TITLE	PART NO.	PRICE		DATE LATEST EDITION		NO. AMENDMENTS ISSUED	
		Part	Manual	Part	Manual	Part	Manual
Aircraft							
Airworthiness Certificates	01	$0.05	None	10/15/42	None	[2] 1	.....
Type and Production Certificates	02	.05	None	3/1/41	None	.....	.....
Airplane Airworthiness	04	.15	[1]	11/1/43	2/1/41	1	5
Engine Airworthiness	13	.05	None	8/1/41	None	.....	.....
Propeller Airworthiness	14	.05	[1]	7/15/42	12/1/38	.....	.....
Equipment Airworthiness	15	Free	$0.10	4/15/44	7/1/38	.....	.....
Radio Equipment Airworthiness	16	0.05	Free	2/13/41	2/13/41	.....	1
Maintenance, Repair, and Alteration of Aircraft, Engines, Propellers, Instruments	18	.05	0.50	9/1/42	6/1/43	.....	.....
Airmen							
Pilot Certificates	20	.10	None	2/15/44	None	2	.....
Airline Pilot Rating	21	.05	None	10/1/42	None	3	.....
Lighter-than-air Pilot Certificates	22	.05	None	10/15/42	None	.....	.....
Mechanic Certificates	24	.05	None	7/1/43	None	.....	.....
Parachute Technician Certificates	25	.05	None	12/15/43	None	.....	.....
Traffic Control Tower Operator Certificates	26	.05	None	2/1/44	None	.....	.....
Aircraft Dispatcher Certificates	27	.05	None	10/1/43	None	.....	.....
Physical Standards for Airmen	29	.05	None	6/1/42	None	1	.....
Air Carriers							
Air Carrier Operating Certification	40	.10	None	11/1/42	None	2	.....
Air Agencies							
Flying School Rating	50	.05	Free	11/1/40	12/40	3	2
Ground Instructor Rating	51	.05	None	12/15/43	None	.....	.....
Repair Station Rating	52	.05	Free	10/1/42	2/41	.....	.....
Mechanic School Rating	53	.05	[1]	8/1/42	5/40	.....	.....
Parachute Loft Certificates and Ratings	54	.05	None	1/21/43	None	.....	.....
Air Navigation							
Air Traffic Rules	60	.10	0.15	11/15/43	8/1/43	6	.....
Scheduled Air Carrier Rules	61	.10	None	2/1/44	None	1	.....
Foreign Air Carrier Regulations	66	.05	None	3/1/42	None	.....	.....
Miscellaneous							
Definitions	98	.05	None	10/15/42	None	.....	.....
Regulations of the Administrator							
Aircraft Registration Certificates	501	Free	None	3/31/43	None	.....	.....
Recordation of Aircraft Ownership	503	Free	None	3/31/43	None	.....	.....
Seizure of Aircraft	531	Free	None	12/8/41	None	.....	.....

[1] Out of stock. [2] Special regulation No. 223.

Note: Those parts and manuals for which there is a price are obtained from the Superintendent of Documents, Government Printing Office, Washington 25, D. C. Remittances must be by cash or by money order, payable to the Superintendent.

Signposts

(*Continued from page* 103)

Tennessee and Nebraska are ready for statewide activity, and are installing markers near training centers. A large program is underway in Missouri under direction of the State Department of Resources and Development. In Illinois, returned veterans will be used in the work of installing the air guides.

The CAA Airways Engineering Division has issued a complete manual written by Mrs. Noyes, for assistance in installing the guides. She has also designed a set of three simple templates made of plywood by which unskilled laborers can lay out any letter of the alphabet or any figure, from 10 to 20 feet in height. The manual contains a table showing the proper distances between various letters and figures. The manual, and the template plan will be made available to anyone interested.

CAB Amends Certificate of 2 Airline Companies

The Civil Aeronautics Board amends the certificate of Transcontinental & Western Air, Inc., to include Terre Haute, Ind., on that carrier's route No. 2 and also the certificate of Chicago and Southern Airlines, Inc., for route No. 53 to extend its service from Memphis, Tenn., to Detroit, Mich., via Paducah, Ky.; Evansville, Indianapolis, Anderson-Muncie-New Castle, Marion, and Fort Wayne in Ind.; and Toledo, Ohio.

L. Welch Pogue, Chairman of the Board, dissented from the majority holding public convenience and necessity did not require the Memphis-Detroit route. The Chairman stated he believed Transcontinental & Western Air, Inc., should have been authorized to serve Detroit, Toledo, Fort Wayne, Anderson-Muncie-New Castle and Indianapolis.

Problems Caused By High Octane Gas Discussed by CAA

Necessity of meeting the enormous aviation fuel requirements of the military services, particularly for the 100 octane combat grade, has resulted in important changes in the composition of aviation fuels which have caused serious operational and maintenance difficulties, particularly with regard to low-powered aircraft engines which use 73 or 80 octane fuels.

Before our entrance into the war, the established grades currently available for both military and civil use were 62, 73, 80, 87, and 91. The principal uses of the various grades of fuel are as follows: Grade 91 is used mainly by the scheduled air carriers and military advanced training aircraft; Grade 87 and some lower grades are used by intermediate powered aircraft; Grades 73 and 80 are used mainly by low-powered aircraft; and Grade 62, where available, is used as a test-stand "run-in" fuel for new and overhauled engines.

In general, engines of higher compression ratios and higher power outputs require fuels of higher octane number. In this regard it is important to bear in mind that the fuel used in an engine should have an octane number at least as high as the minimum value specified on the nameplate of the engine, otherwise detonation ("knocking") is likely to occur, and if severe can result in extensive damage to the engine.

Due to war demands for high octane number fuels, it became necessary to increase the amount of tetra-ethyl lead contained in the various fuels.

Excessive Lead Deposits.—The difficulties encountered in the use of the more highly leaded wartime fuels in engines of low-powered aircraft have consisted mainly of aggravated spark plug fouling, exhaust valve sticking and burning, piston ring sticking, overheating and detonation. The more or less chronic occurrence of these difficulties is believed due to excessive lead deposits in the engines. The effect of these troubles has been to necessitate more frequent spark plug changes and engine top overhauls. The wartime shortage of replacement materials has further aggravated the situation.

When reports indicated the difficulties mentioned presented a major problem, the Aircraft Engineering Division of the CAA initiated a survey, and on the basis of this study issued Safety Regulation Release No. 148, in which the use of leaded 73 and 80 octane fuels in aircraft engines of low horsepower was discussed. Copies may be obtained from the CAA Correspondence Section, Ref. A251.

Remedies Suggested.—The following precautionary measures are beneficial in counteracting or alleviating the difficulties that had been experienced from the use of leaded fuels:

1. Spark plug fouling. Remove and clean the plugs every 25 hours, or as often as found necessary.

2. Valve sticking and burning. Frequent and regular direct applications of penetrating oil, or periodic use of "top lubricant" in the fuel.

3. Overheating and detonation. Ascertain that the correct grade of fuel and correct type of spark plugs are being used. Check for air leaks in induction system, and determine that cooling baffles are in good condition and properly positioned. Should difficulty persist, retard the ignition timing 1 to 5 degrees as recommended by the engine manufacturers. Should difficulty still persist, try next higher octane number fuel. If the engine is detonating and/or overheating, corrections should be accomplished immediately in order to preclude possible engine failure at a later date.

4. Piston ring sticking. Use correct brand and grade of oil, and observe recommended oil change periods. Observance of precautions in Item 3 above will usually eliminate this trouble.

No serious difficulties have been experienced by the scheduled air carriers, that have been definitely attributable to the use of the present Grade 91 fuel. The most noticeable effect has been an increase in spark plug fouling.

With regard to the foregoing difficulties experienced with the more highly leaded wartime fuels, it should be borne in mind that the low-powered aircraft engines (as a group), both horizontally-opposed and radial, were not developed to operate on leaded fuels, as were all the high-powered and most of the intermediate-powered engines. As a result, the low-powered engine group has suffered more severely because of the changes made in the fuels.

One other problem concerns the adverse effect of "aromatic" fuels on prewar type synthetic rubber components of the airplane fuel system. Because aromatic fuels are more prone to swell and deteriorate such materials, it has been necessary to construct synthetic rubber fuel cells, fuel line hose, various diaphragms, gaskets, etc., of special aromatic resistant materials.

Recent CAA Releases

The influence of aviation on real estate values is discussed in an address made by William A. M. Burden, Assistant Secretary of Commerce, before the National Association of Real Estate Boards.

Medicine in relation to flying is treated in three papers read before a meeting of the Aero Medical Association of the United States by Dr. W. R. Stovall, Chief of the CAA Medical Division. Dr. W. F. Smith, Chief of the Physical Standards Section, and Malcolm Y. McCormick, medical analyst of the Division.

Copies are obtainable from the CAA Information and Statistics Service, Commerce Building, Washington 25, D. C.

Lap-size Vibration Recorder on Sale Developed by CAA

A portable flight vibration recorder easily and quickly installed for studying airplane vibration and flutter during flight, has been developed by the CAA and is now available commercially.

The self-contained instrument is light enough to be held on the lap of an observer, and can be installed and put into use within half a day. It was developed by the Aircraft Development Section of the Technical Development Division, and is being manufactured by the Brown Instrument Company of Philadelphia.

The new recorder does not replace the more elaborate and complicated equipment already in use for studying flutter in planes. Its value is in its small size and ease of installation, making possible rapid re-examination of doubtful studies, and many more tests in difficult cases.

Flutter can be, and in most cases is, avoided in designing planes. Especially in large planes, it rarely appears in the first model, in any severe form. Sometimes it appears in a particular plane after months of use where it did not exist in the prototype. By using the new recorder, velocity or acceleromator type pickups can be placed at many places about the structure, and two of these can be operated simultaneously. By using a selector switch, many locations about the plane can be studied in the same flight. The recorder contains its own batteries, amplifier, electronic switch, cathode ray tube and a means for observing the record on a screen. There is also a camera to photograph the oscillograph record.

For exhaustive flutter study, equipment weighing between 300 and 500 pounds previously has been used. Installation and tests by this method required about two weeks.

The smaller machine is useful in studying vibration anywhere about the plane, such as in motor mounts, cowling and small accessories, where its ease of installation as a special purpose instrument is important.

Present knowledge of flutter has been built up over years, and has been gathered from experiments on the ground and in flight. Vibrating machines are still used to simulate flight conditions on the ground. In a few cases, radio-controlled planes have been used with recordings transmitted to the ground during flight, and test pilots have flown planes equipped with recorders which transmit their reports by radio to the ground. For all of these methods, the new recorder is a valuable auxiliary.

Development of the new recorder was begun by the CAA in cooperation with the Brown company in 1940 to make possible accurate measurement of the response of the entire aircraft structure to pulsating and vibratory forces. The CAA's work was under the immediate direction of Albert London.

ENGINEERING LIBRARY
DUKE UNIVERSITY
DURHAM, N. C.